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ABBREVIATIONS

ADDR.	ADDRESS (FOR PORT AUTHORITY PLANT & STRUCTURE USE)	EXST.	EXISTING	RM	ROOM
ANNUN.	ANNUNCIATOR	FA	FIRE ALARM	RMT	REMOTE MULTIPLEX TERMINAL
AFF	ABOVE FINISHED FLOOR	FCO	FUSE CUTOFF	SPK	SPEAKER
ALD	ANALOG LOOP DRIVER	FL	FLOOR	SOL	SOLENOID
ATC	ADDRESSABLE TERMINAL CABINET	FMC	FLEXIBLE METALLIC CONDUIT	STR	STROBE
CAB.	CABINET	GSC	GALVANIZED STEEL CONDUIT	SE	SOUTHEAST
CKT(S)	CIRCUIT(S)	HRN	HORN	SW	SOUTH-WEST
cd	CANDELA	JB	JUNCTION BOX	TEL	TELEPHONE
CL	CLOSET	MCC	MOTOR CONTROL CENTER	TSC	TERMINAL STRIP CABINET
COL	COLUMN	MER	MECHANICAL EQUIPMENT ROOM	TYP	TYPICAL
CONT.	CONTINUATION	N.T.S.	NOT TO SCALE	U.O.N.	UNLESS OTHERWISE NOTED
DWG	DRAWING	NE	NORTHEAST	WTC	WORLD TRADE CENTER
EL	ELECTRIC(AL)	NW	NORTHWEST	WT	WARDEN PHONE
ELV	ELEVATOR	PB	PULL BOX		
EMR	ELEVATOR MACHINE ROOM	PNL	PANEL		

LEGEND

HEAVY LINE	INDICATES WORK TO BE DONE
HEAVY DASHED LINE	INDICATES DEVICE AND/OR CIRCUITRY TO BE REMOVED
LIGHT LINE	INDICATES EXISTING TO REMAIN
DASHED & DOTTED LINE	INDICATES NEW CABLE(S) ROUTED IN EXIST. CONDUIT
---W---	EXISTING FLEXIBLE CONDUIT TO BE REMOVED
---	DASHED LIGHT LINE INDICATES FUTURE WORK BY OTHERS.
3/4" GSC	FIRE ALARM CABLE IN 3/4" GALVANIZED STEEL CONDUIT.
3/4" GSC	CABLE ENTERING LEV. END OF CONDUIT T. BUSHING.
2A OR B	NUMBER OF CABLE.
A	TYPE OF CABLE
2#12 AWG, 200°C, 600V SHIELDED TWISTED PAIR TEFLON CABLE, CLASS E, AND BSA APPROVED N.Y.C. FOR LOCAL LAW #5.	
B	2#14 AWG, 200°, 600V UNSHIELDED TWISTED PAIR TEFLON CABLE, CLASS E, AND BSA APPROVED N.Y.C. FOR LOCAL LAW #5.
FCO	FUSE CUT OUT, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR.
XNET	XNET CABINET, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR.
PAD	AUXILIARY POWER SUPPLY PAD-2R, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR, SEE DETAIL "D" ON DWG E-36.
PAD-XXX-X	PAD NUMBER TSC NUMBER
F	ADDRESSABLE PULL STATION, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR, SEE DETAILS "E" ON DWG E-36.
XXX-XXX	ADDRESSABLE SMOKE DETECTOR PYROTROXONICS MODEL #FP-11 WITH MOUNTING BASE PYROTROXONICS MODEL #DB-11, NO SUBSTITUTIONS. "XXX" REPRESENTS LAST THREE DIGIT DEVICE ADDRESS ONLY. CONTRACTOR SHALL TAG DETECTOR HAD AND BASE WITH COMPLETE SIX DIGIT DEVICE ADDRESS (INCLUDING NETWORK/LOOP AND DEVICE ADDRESSES) AS SHOWN ABOVE. FOR INSTALLATION, SEE DETAIL "C" ON DWG E-35 AND DETAILS "A", "C" ON DWG E-36.
XXX-XXX	ADDRESSABLE SMOKE DETECTOR PYROTROXONICS MODEL #FP-11 WITH HOUSING MODEL #AD-31P AND SAMPLING TUBE MODEL #STA-X. THE SAMPLING TUBE SIZE TO BE FIELD SELECTED BASED ON THE DUCT SIZE. NO SUBSTITUTIONS. "XXX" REPRESENTS LAST THREE DIGIT DEVICE ADDRESS ONLY. CONTRACTOR SHALL TAG DETECTOR HAD AND BASE WITH COMPLETE SIX DIGIT DEVICE ADDRESS (INCLUDING NETWORK/LOOP AND DEVICE ADDRESSES) AS SHOWN ABOVE. FOR INSTALLATION, SEE DETAIL "D" ON DWG E-35.
XXX-XXX	PYROTROXONICS MODEL TRI-B6R ADDRESSABLE INTERFACE SWITCH MODULE WITH SQUARE D TYPE KP12 RELAY MOUNTED IN JUNCTION BOX. SEE DETAILS "G" AND "H" ON DWG E-36.
XXX-XXX	PYROTROXONICS MODEL TRI-B6D DUAL ADDRESSABLE INTERFACE SWITCH MODULE MOUNTED IN 6"x6"x4" JUNCTION BOX. SEE DETAIL "I" ON DWG E-36.
XXX-XXX	ALD LOOP DEVICE ADDRESS: FIRST THREE DIGIT REPRESENT NETWORK/LOOP ADDRESS (AS DIRECTED BY ENGINEER), AND LAST THREE DIGIT REPRESENT DEVICE ADDRESS.
15cd	WALL MOUNTED STROBE WITH BACK BOX WHEELLOCK MODEL #SHBB. THE NUMERALS WITH SUFFIX "cd" INDICATES STROBE CANDELA RATING AND MODEL # AS FOLLOWS: 15cd - 15 CANDELA STROBE, WHEELLOCK MODEL #RSS-2415W-FR 30cd - 30 CANDELA STROBE, WHEELLOCK MODEL #RSS-2430W-FR 75cd - 75 CANDELA STROBE, WHEELLOCK MODEL #RSS-2475W-FR NO SUBSTITUTIONS. SEE DETAIL "B" ON DWG E-36.
2W, 15cd	WALL MOUNTED COMBINATION STROBE/SPEAKER UNIT WITH BACK BOX WHEELLOCK MODEL #SBB, LISTED WITH RESPECTIVE CANDELA RATED STROBE, THE NUMERALS, WITH SUFFIX "W" INDICATES SPEAKER TAP SETTING AND SUFFIX "cd" INDICATES STROBE CANDELA RATING AND MODEL # AS FOLLOWS: a) FOR SPEAKER TAP SETTING 4W: 30cd - 30 CANDELA STROBE WITH SPEAKER, WHEELLOCK MODEL #ET70-2430W-FR 75cd - 75 CANDELA STROBE WITH SPEAKER, WHEELLOCK MODEL #ET70-2475W-FR b) FOR SPEAKER TAP SETTING LESS THAN OR EQUAL TO 2W: 15cd - 15 CANDELA STROBE WITH SPEAKER, WHEELLOCK MODEL #E70-2415W-FR 30cd - 30 CANDELA STROBE WITH SPEAKER, WHEELLOCK MODEL #E70-2430W-FR NO SUBSTITUTIONS. SEE DETAIL "B" ON DWG E-36.
E.O.L.	END OF LINE (1/2 WATT 24KΩ U.O.N.) RESISTOR.
WT	WARDEN TELEPHONE, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR. MOUNTING HEIGHT 48" AFF TO CENTERLINE. SEE DETAIL "J" ON DWG E-36.
P	SQ. PULL BOX 4 11/16" - UNLESS OTHERWISE NOTED
K	POLARIZED ELECTRONIC HORN PYROTROXONICS MODEL SEA-3 WITH TONE MODULE TM-1 AND END OF LINE DEVICE EL-32. NO SUBSTITUTION.
PS	AUXILIARY POWER SUPPLY, PYROTROXONICS MODEL AS/P55-BFS-24-UL, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR.
BB	BATTERY CABINET BB-55R, FURNISHED BY THE AUTHORITY, INSTALLED BY THE CONTRACTOR.
PS	EXISTING WATER FLOW SWITCH
TS	EXISTING TAMPER SWITCH
P	EXISTING PULL BOX
2W	EXISTING SPEAKER TO REMAIN
K	EXISTING SPEAKER TO BE REMOVED
Q	EXISTING JUNCTION BOX TO BE REMOVED
Q	EXISTING SMOKE DETECTOR TO BE REMOVED
Q	EXISTING DUCT DETECTOR TO BE REMOVED
Q	EXISTING DELUGE SOLENOID VALVE
TSC	EXISTING TERMINAL STRIP CABINET
ATC	EXISTING ADDRESSABLE TERMINAL CABINET
NTC	EXISTING NETWORK TERMINAL CABINET

GENERAL NOTES:

- ALL FIRE ALARM CABLES SHALL BE TYPE FPLP-UL TWISTED PAIR #14 GAUGE SOLID COPPER, 200°C, 600V, SHIELDED (EXCEPT FOR SPEAKERS WHICH USE UNSHIELDED), INSULATED CONDUCTORS, CLASS "E", BSA AND MEA APPROVED FOR NYC LOCAL LAW #5 WITH FEP (TEFLON OR APPROVED EQUAL) INSULATION, AND CONDUCTORS COLORED BLACK & RED. ALL OPEN AREA AND MEPS WILL UTILIZE CONDUITS.
- ASSEMBLE DRAIN WIRE AT BOTH ENDS OF SHIELDED CABLES USING TYPICAL SHIELD/DRAIN INSULATING METHOD AS SHOWN ON DRAWING E-35, DETAILS "A" AND "B". SHIELD MUST BE CONTINUOUS THROUGHOUT THE CIRCUIT AND INSULATED.
- PROGRAMMING OF BASE BUILDING SYSTEM FIRE ALARM PANELS WILL BE BY THE ENGINEER. PROGRAMMING OF ALL ADDRESSABLE DEVICES (SMOKE DETECTORS, TRPS) SHALL BE BY THE CONTRACTOR. FINAL CONFIRMATION OF ADDRESSES SHALL BE AS DIRECTED BY ENGINEER, PRIOR TO PROGRAMMING DEVICES.
- SET TAP SETTINGS ON ALL SPEAKERS (AS SHOWN ON DWG'S), PRIOR TO INSTALLATION.
- ALL CONDUITS SHALL BE RIGID STEEL, HOT DIPPED GALVANIZED WITH THREADED FITTINGS (U.O.N.).
- ALL PENETRATIONS MADE IN EXISTING FIRE ALARM EQUIPMENT SHALL BE MADE IN THE PRESENCE OF THE ENGINEER. NO TOP PENETRATIONS SHALL BE MADE IN ANY FIRE ALARM PANELS.
- PATCH & SEAL PENETRATIONS FROM ALL CONDUITS PASSING THRU WALLS AND PLENUMS WITH THERMAFIBER (O.A.E.).
- FOR MOUNTING DETAILS AND WIRING DIAGRAMS OF SPEAKERS, STROBES, PAD'S, WARDEN PHONE, PULL STATION AND SMOKE DETECTORS, SEE DWG'S E-35 AND E-36. NO "T" TAPPING WILL BE PERMITTED. ALL BOX COVERS, CONDUIT COVERS, ETC. SHALL BE PAINTED RED. USE 2" STENCIL AND WHITE PAINT ON ALL BOX COVERS INDICATING "5" FOR 5 WTC SYSTEM DESIGNATION.
- ALL DEVICES AND WIRING SHALL BE LABELED AS PER THESE DRAWINGS AND AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL USE BRADY LABELS #WAL-205-292-1 (O.A.E.) FOR LABELING OF ALL CONDUCTORS AND #WAL-305-292 (O.A.E.) FOR LABELING OF ALL CABLES.
- CONTRACTOR SHALL REMOVE EXISTING SPEAKERS AND SMOKE DETECTORS, ONLY AFTER DEVICES TO BE INSTALLED ARE OPERATIONAL AND IN THE PRESENCE AND UNDER THE DIRECT SUPERVISION OF THE ENGINEER.
- ALL EQUIPMENT SHOWN TO BE REMOVED SHALL HAVE ITS ASSOCIATED TERMINATION WIRING REMOVED BACK TO THE SOURCE, UNLESS OTHERWISE SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL REMOVED MATERIAL.
- CONTRACTOR SHALL TEST, PRIOR TO INSTALLATION, ALL REELS OF FIRE ALARM CABLES FOR CONTINUITY AND SHORT CIRCUITS.
- UPON INSTALLATION AND 24 HOUR NOTICE TO THE ENGINEER, FIRE ALARM CABLES SHALL BE TESTED IN THE PRESENCE OF THE ENGINEER, IN ACCORDANCE TO THE AUTHORITY'S SPECIFICATION #16910. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- GROUNDING BUSHINGS SHALL BE INSTALLED ON ALL CONDUITS PENETRATING ALL PANELS, CABINETS OR ENCLOSURES (U.O.N.), EXCLUDING FCO ENCLOSURE. INSTALL #10 X19M-2 GREEN STRANDED GROUND WIRE FROM BUSHING TO PANEL, CABINET OR ENCLOSURE GROUND STUD.
- ALL PANELS, FCO, BOXES AND WIRWAYS SHALL BE SUPPORTED BY 1 1/2" CHANNEL KINDORF CATALOG #B-905 (O.A.E.), UNLESS OTHERWISE NOTED.
- THE EXACT LOCATION OF ALL EQUIPMENT SHALL BE APPROVED BY THE ENGINEER, PRIOR TO INSTALLATION.
- ALL FINISHES DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO MATCH THEIR ORIGINAL CONDITION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SHAPING, TESTING, LABELING AND TERMINATING OF ALL F.A. CABLES AND POWER CONDUCTORS TO ALL F.A. EQUIPMENT REFERRED TO IN THIS PROJECT INCLUDING BUT NOT LIMITED TO XNET CABINETS, INTERFACE PANEL, PAD, TSC, ATC, FCO AND NTC ENCLOSURES AND AT THE ERP PANELS.
- INSTALL AREA SMOKE DETECTOR IN EXISTING ACS UNITS BETWEEN FILTERS AND REHEAT COILS. SEE DWG E-36 TYPICAL DETAIL "C".
- LABELING OF SHUTDOWN CONDUCTORS AT EXISTING MCC PANELS WILL BE PERFORMED BY THE CONTRACTOR. CONTRACTOR TO LEAVE 30"-0" COIL OF CABLE INSIDE THE MCC. THIS WORK SHALL BE DONE IN PRESENCE OF THE ENGINEER. FINAL CONNECTIONS TO MCC PANELS WILL BE MADE BY OTHERS.
- FOR XNET AND INTERFACE CABINETS ASSEMBLY AND WIRING, SEE CERBERUS DIVISION OF SIEMENS REFERENCE DRAWINGS MXL-XNET/MER-NE-9 AND MXL-XNET/MER NE-B1.
- ASBESTOS IS PRESENT AT THE FOLLOWING LOCATIONS ON 9th FLOOR:
a) FLUFFY INSULATION MATERIAL FROM A HEAT TRANSFER PIPE LOCATED WEST OF ACS-9-1N UNIT IN THE MECHANICAL EQUIPMENT ROOM.
b) FLUFFY INSULATION MATERIAL FROM A HEAT TRANSFER PIPE LOCATED WEST OF THE RETURN AIR SHAFT.
c) CEMENTITIOUS INSULATION MATERIAL TROWELED ON A BEAM WEST OF THE RETURN AIR SHAFT.
CONTRACTOR SHALL AVOID THESE LOCATIONS IN THE PERFORMANCE OF THE WORK.

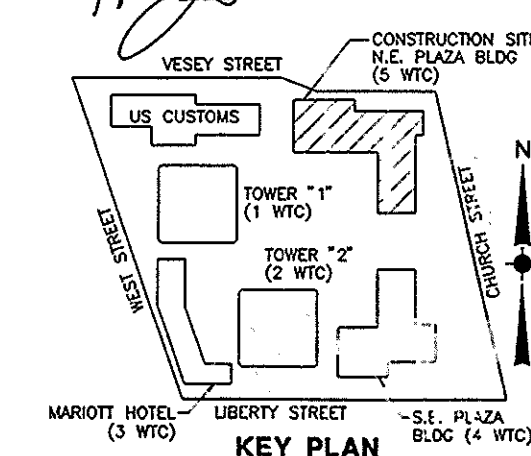
DUCT MOUNTED SMOKE DETECTORS PLACEMENT CRITERIA

- DUCT MOUNTED SMOKE DETECTORS SHALL BE PLACED AND INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS AND THE 1990 EDITION OF NFPA 72E, STANDARD ON AUTOMATIC FIRE DETECTORS.
- SELECTION AND TRIMMING OF SAMPLING TUBE LENGTH SHALL BE BASED ON THE DUCT WIDTH WHERE THE DUCT MOUNTED SMOKE DETECTOR IS INSTALLED, CONFORMING TO MANUFACTURER'S RECOMMENDATIONS.
- DUCT MOUNTED SMOKE DETECTORS SHALL ONLY BE INSTALLED IN STRAIGHT RUN OF DUCT WITH A MINIMUM LENGTH OF 36".
- INSTALL SMOKE DETECTOR AT THE CENTER LINE OF THE DUCT HEIGHT AND AS CLOSE AS POSSIBLE TO SIX (6) DUCT WIDTHS FROM ANY BENDS OR CONNECTIONS. WHERE SUCH CONDITION IS NOT FEASIBLE, SMOKE DETECTOR SHALL BE INSTALLED AT THE MID POINT OF THE STRAIGHT RUN.
- FOR ANY SMOKE DETECTOR ASSOCIATED WITH RETURN AIR FAN (ACR) OR EXHAUST FAN (E), ONLY ONE (1) SMOKE DETECTOR WILL BE REQUIRED, TO BE INSTALLED AT THE STRAIGHT DUCT, DOWNSTREAM OF THE AIRFLOW FROM THE FAN.
- DUCT MOUNTED SMOKE DETECTOR SHALL BE INSTALLED AT LEAST 12" AWAY FROM ANY EXISTING DETECTORS.

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF ONE OF THE CONTRACT DRAWINGS CONSTITUTING A PART OF CONTRACT NO. WTC-861.571 IN THE FORM IN WHICH SAID DRAWINGS EXISTED AT THE TIME THE SAID CONTRACT WAS EXECUTED BY THE PARTIES.

DATE 12/14/99 Michael E. Royzman
CONTRACT ENGINEER

DATE 12/14/99 Michael E. Royzman
ENGINEERING PROGRAM MANAGER



THE PORT AUTHORITY
OF NY & NJ

ENGINEERING PROGRAM MANAGER
Michael E. Royzman
CHIEF ELECTRICAL ENGINEER

No. Date Revision Approved

ENGINEERING DEPARTMENT

WORLD
TRADE
CENTER

ELECTRICAL

Title
FIRE ALARM SYSTEM
PHASE III
5 WTC MER'S, EMR'S
AND SUBSTATIONS

INDEX OF DRAWINGS,
LEGEND, ABBREVIATIONS,
KEY PLAN AND
GENERAL NOTES

This drawing subject to conditions in Contract /
Intention, ideas, designs and methods are the
property of Port Authority and may not be used
without its written consent.

FELDSHEIN ROYZMAN
Designed by Drawn by

5-17-99
Date

WTC-861.571
Contract Number Drawing